AYDIN DISPLAYS

a sparton company

USERS GUIDE
FOR
MODEL 4424S
24 INCH
AMLCD COLOR MONITOR

P/N 356-7040-501

Document No. 150-4424-002 Rev. (A), February 2012

NOTICE

This manual is subject to change without notice and should not be construed to be a commitment in any form by Aydin Displays.

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Doc. No. 150-4424-002 Rev. (A), February 2012

WARNING

TO PREVENT FIRE OR SHOCK HAZARDS, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE. ALSO DO NOT USE THIS UNIT'S POLARIZED PLUG WITH AN EXTENSION CORD RECEPTACLE OR OTHER OUTLETS UNLESS THE PRONGS CAN BE FULLY INSERTED.
DO NOT OPEN THE CABINET. THERE ARE HIGH VOLTAGE COMPONENTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

CAUTION

RISK OF ELECTRIC SHOCK. DO NOT OPEN.

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER OR BACK, NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

This symbol warns the user that uninsulated voltage within the unit may be large enough to cause electric shock. Therefore, it is dangerous to touch any part inside the unit.

This symbol alerts the user that important literature about the operation and maintenance of this unit has been included. Read it carefully to avoid any problems.

PRODUCT SAFETY PRECAUTIONS

- Follow all warnings and instructions marked on the display.
- Do not attempt to service this display yourself. Removing the display cover or back may expose you to dangerous voltage or other risks. Refer all servicing to qualified service personnel.
- Adequate ventilation must be maintained to ensure reliable and continued operation and to protect the display from overheating. Do not block ventilation slots and openings or install the display in a place where ventilation may be hindered.
- This display should be operated from the type of power source indicated on the displays rating label.
- Do not allow metal pieces or objects of any kind to fall into the display through the ventilation holes.

Thank you for purchasing this Aydin Displays LCD Display.

The carton contains the items listed below:

- 4424S LCD Display
- Product CD containing:
  - This User's Guide
  - Warranty Guide

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4424S DISPLAY FEATURES

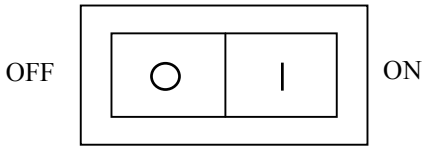
- **Capable of displaying 16,772,166 colors:** The display's high-contrast LCD enhances color vibrancy and improves focus with no geometric distortion.
- **Multiple Frequency Technology:** Automatically adjusts the display to the video card's scanning frequency, thus displaying the resolution required.
- **Wide viewing angle:** ±80° typical all directions.
- **Power Supply:** All units are supplied with an internal power supply.

1. CONNECTIONS AND SETUP

To connect the LCD display to your system, follow these instructions:

CAUTION: Turn power off to the computer, display, and power supply before making any connections.

The power ON/OFF switch designations are as follows:



1.1 Power Connections

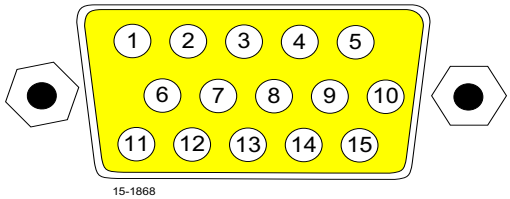
AC operating input voltage is single phase, 115 VAC, 60 Hz.

Voltage:	88 - 264 VAC Auto-ranging, Single-phase (115 VAC typical)
Frequency:	47 - 63 Hz (60 Hz typical)
Power:	100 W (typical)
Chassis Connector:	D/MS3102A-10SL-3P
Connector Signal Names:	
	Pin A: AC Input
	Pin B: AC Input / Return
	Pin C: Chassis Ground
Mating Connector:	MS3106A-10SL-3S or equivalent
Fuse:	3AG 1.6Amp/250 Volt Slow blow with spare on rear
Auxiliary Chassis Ground:	6-32 Stud on rear

1.2 I/O Connections

1.2.1 VGA Video Signal Connections

The VGA video input is RGB compatible only and supports EDID, Revision 1.3.
The LCD is supplied with a 15-pin, D-sub to 15-pin, D-sub cable.
Pin assignments for the 15-pin connector are shown below.



Pin #	Description	Pin #	Description
1	Red Video Input	9	DDC +5VDC (EDID power)
2	Green Video Input	10	Sync Return
3	Blue Video Input	11	No Connection
4	No Connection	12	DDC Data (EDID SDA)
5	DDC Ground (EDID)	13	H-sync/Composite sync
6	Red Video Return	14	V-sync
7	Green Video Return	15	DDC Clock (EDID SCL)
8	Blue Video Return		

1.2.2 DVI Digital VIDEO Signal Connections

The DVI input is Single Link Digital Video input only and supports EDID, revision 1.3. The DVI input connector uses a Dual Link DVI-I female connector to accept both DVI-I and DVI-D video cables.

Note: This is a dual-link DVI-I connector. It will mate with dual-link DVI-I, single-link DVI-I, dual-link DVI-D, and single-link DVI-D connectors. However, it is electrically wired for a single-link DVI-D interface only. The analog inputs are not connected.

DVI Pin Connections:

Pin #	Description	Pin #	Description
1	TMDS Data 2- (Red link-)	16	Hot Plug Detect
2	TMDS Data 2+ (Red link+)	17	TMDS Data 0- (Blue link-)
3	TMDS Data 2 Shield	18	TMDS Data 0+ (Blue link+)
4	No Connection	19	TMDS Data 0 Shield
5	No Connection	20	No Connection
6	DDC Clock (EDID SCL)	21	No Connection
7	DDC Data (EDID SDA)	22	TMDS Clock Shield
8	No Connection	23	TMDS Clock +
9	TMDS Data 1- (Green link-)	24	TMDS Clock -
10	TMDS Data 1+ (Green link+)	C1	No Connection
11	TMDS Data 1 Shield	C2	No Connection
12	No Connection	C3	No Connection
13	No Connection	C4	No Connection
14	DDC +5VDC (EDID Power)	C5	No Connection
15	DDC Ground (EDID Ground)		

1.2.3 Host Computer Interface (RS232) Connections

Connect an RS232 Serial Cable (not provided) to the DB9 female RS232 input connector on the back of the unit to the host computer RS232 Interface. Pin assignments for the DB9 female connector are shown below.

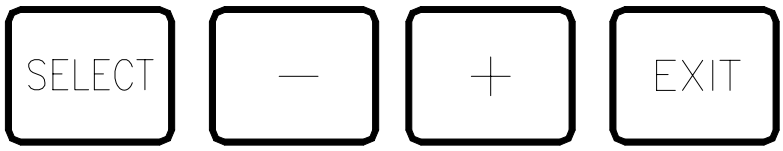
Pin	Signal	Pin	Signal	Pin	Signal
J8-1	No Connection	J8-4	No Connection	J8-7	No Connection
J8-2	Transmit Data (TXD)	J8-5	GND	J8-8	No Connection
J8-3	Receive Data (RXD)	J8-6	No Connection	J8-9	No Connection

2. DISPLAY ADJUSTMENT

If you have any problems connecting, setting up or operating the display, please refer to the Troubleshooting section of this guide.

Plug the LCD power cord into an AC power source. Turn ON the power switch and the green ON LED should light.

A typical adjustment sequence is: Width, Horizontal Position, repeat Width, Focus and then Vertical Position. Display height is preset and not adjustable.



2.1 Control Panel Function Buttons

2.1.1 LCD Adjustment Pushbuttons

When necessary, the unit is adjusted using an On-Screen Display (OSD) and the following pushbuttons:

SELECT MODE

Enables the Main Menu, Sub Menu, and parameter to be adjusted.

ADJUST & SELECT

The pushbuttons are used to select a main or sub menu and are then used to make the adjustments once a function is selected using the OSD and SELECT MODE key.

The Adjustment pushbuttons are used as Hot Buttons to increase or decrease the Backlight Intensity when the OSD is not enabled.

EXIT

The EXIT pushbutton is the complement of SELECT MODE and allows you to exit menu selections by returning the user to the previous menu or exiting the OSD.

2.1.2 Front Panel Indicators

LED indicators located on control panel:

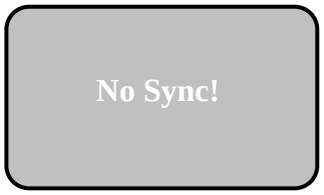
NO SYNC (Amber) – Indicates that the monitor is not receiving or cannot synchronize to the external video input.

POWER (Green) – indicates that the monitor is powered.

2.1.3 Power Management

When Horizontal or Vertical Sync is not detected, the amber NO SYNC indicator will light and the No Sync symbol will appear (see below).

When the Horizontal or Vertical Synchronization frequencies being supplied to the unit are not within the range of the AMLCD monitor, or when No Signal is applied, the No Sync symbol will appear.



To extinguish the No Sync symbol and display an image, do one of the following:

- Supply a format with Horizontal or Vertical Synchronization frequencies that are compatible with the display.
- Connect a video source to the selected video input on the display
- Enable the correct video input source by pushing the EXIT button and select the desired video input source using the OSD.

2.2 On-Screen Control Function Items

2.2.1 OSD (ON SCREEN DISPLAY) – PRE ADJUSTMENT NOTICE

2.2.1.1 OSD Timeout Period

The OSD (On Screen Display) has a user-selectable Timeout Period.

If the OSD is activated and no front panel control keys are depressed for a period of 5 to 60 seconds, the OSD will automatically deactivate. Any adjustments made prior to timeout will be stored.

If the Timeout Period is set to zero, the OSD will remain continuously enabled, until deactivated by one of the following conditions:

- Pressing the front panel "EXIT" key as often as required to reach and exit the Top Level menu
- Unit power is turned off.

The Timeout Period function is accessed via the OSD/RESET menu.

2.2.1.2 OSD Activation

If the OSD (On Screen Display) is not visible, press the front panel "SELECT" key, once, to activate the OSD.

2.2.1.3 OSD Menu:

Observe the following Top-Level Menu Selection Tabs on the OSD Menu:

- **MAIN**
- **IMAGE**
- **COLOR**
- **CONTROLS**
- **OSD/RESET**

MAIN is the default foreground menu; the active menu will always appear in the foreground.

The Selection Tab of the active menu will be highlighted in blue.

See the OSD – SAMPLE IMAGES section of this document for sample images of OSD menus.

- Picture Width, Horizontal and Vertical Centering, Clock Phase, Menu position adjustments via OSD
- Auto-adjust – automatically size (scale as required) and center picture to full screen with auto adjustment for clock phase (for VGA mode only)
- Contrast Adjustment (video amplitude of all the video signals)
- Black-Level Adjustment for Analog RGB input (Individual R, G, B video gain adjustments)
- Color Adjustments for setting color temperature or individual Red, Green, and Blue
- Each adjustable function has built in limits so that the user cannot cause the controller to hang up when adjusted to their limits
- Factory Preset for Contrast and Brightness and all other Firmware defined functions
- An on-screen Indicator is provided to indicate the range and direction of the adjustment being made

2.2.2 OSD (ON SCREEN DISPLAY) – STORED VALUES

Values chosen during OSD interaction are stored in memory under the following conditions:

- The front panel "**EXIT**" is pressed
- Timeout period expires

Values chosen during OSD interaction are not stored in memory under the following conditions:

- Unit power is turned off prior to pressing the front panel "EXIT" key
- Unit power is turned off prior to the expiration of the timeout period

Values stored in memory are retained indefinitely. Unit power is not required to retain stored values.

2.2.3 OSD MENU NAVIGATION – MAIN MENU

If the OSD is not visible, press the front panel "SELECT" key once to activate the OSD. Observe the following choices in the MAIN Menu Selection List:

- **Source** - (Multiple Sub-Function Selection Buttons)
- **Scaling** - (Multiple Sub-Function Selection Buttons)
- **Video Brightness** - (Level Adjust Function)
- **Contrast** - (Level Adjust Function)
- **Hue** - (Level Adjust Function)
- **Saturation** - (Level Adjust Function)
- **Black Level** - (Level Adjust Function) (Available in VGA Mode only)

Press the front panel "SELECT" key again to activate the MAIN menu. The OSD will auto-index to the first selection (Source) on the menu list. The selection will be highlighted with a raised background and a blue indicator dot as per the example below.

Press the front panel [-] or [+] keys to navigate through the Selection List

When the desired selection is highlighted, press the front panel "SELECT" key to access the highlighted selection

After the desired selection is activated, press the front panel [-] or [+] keys to perform the following:

1) Choose the desired Sub-Function.

The currently selected Sub-Function will be distinguished by the white font color displayed on the Selection Button.

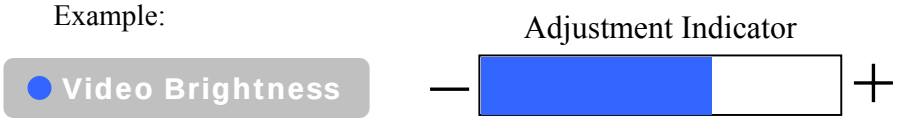
Example:

After the desired Sub-Function is highlighted, press the front panel "SELECT" key to activate the highlighted Sub-Function

Press the front panel "EXIT" key one time to resume navigation in the Menu Selection List

2) Adjust the desired Level.

Example:



After the desired selection is activated, press the front panel [-] or [+] keys to set the desired level.

Press the front panel "EXIT" key one time to activate the desired level and resume navigation in the MAIN Menu Selection List

Press the front panel "EXIT" key one additional time to resume navigation in the Top- Level OSD menu.

Pressing "EXIT" while in the Top-Level of the OSD menu will deactivate the OSD.

2.2.4 OSD MENU NAVIGATION – IMAGE MENU (MAIN VGA MODE)

If the OSD is not visible, press the front panel "SELECT" key, once, to activate the OSD. Press the front panel [-] or [+] keys to navigate to the IMAGE menu.

NOTE: The IMAGE menu is available only when the VGA mode is selected as the MAIN picture mode.

Observe the following choices in the IMAGE Menu Selection List:

- **Auto Adjust** - (Single Sub-Function Selection Button)
- **Auto Gain** - (Single Sub-Function Selection Button)
- **Phase** - (Level Adjust Function)
- **Clock** - (Level Adjust Function)
- **Horizontal** - (Level Adjust Function)
- **Vertical** - (Level Adjust Function)

When the **IMAGE** menu is highlighted, press the front panel "**SELECT"** key to access the **IMAGE** menu. The OSD will auto-index to the first selection (**Auto Adjust**) on the menu list. The selection will be highlighted with a raised background and a blue indicator dot as per the example below.

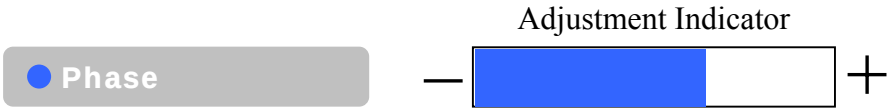
Press the front panel **[-]** or **[+]** keys to navigate through the Selection List

The **Auto Adjust** and **Auto Gain** selections have only one Sub-Function Selection Button. The Sub-Function Selection Buttons for either of these modes are auto-selected and highlighted in blue, when chosen from the selection list. See examples below:

When the desired selection is highlighted, press the front panel "**SELECT"** key to activate the highlighted selection

The remaining items in the **IMAGE Menu** Selection List, are associated with Level Adjust Functions

Example:



Press the front panel [-] or [+] keys to navigate through the Selection List.

Press the front panel "SELECT" key to activate the desired level function.

After the desired selection is activated, press the front panel [-] or [+] keys to set the desired level.

Press the front panel "EXIT" key one time to accept the desired level and resume navigation in the IMAGE Menu Selection List.

Press the front panel "EXIT" key one additional time to resume navigation in the Top- Level OSD menu.

Pressing "EXIT" while in the Top-Level of the OSD menu will deactivate the OSD.

2.2.5 OSD MENU NAVIGATION – COLOR MENU

If the OSD is not visible, press the front panel "SELECT" key once to activate the OSD. Press the front panel [-] or [+] keys to navigate to the COLOR menu.

Observe the following choices in the COLOR Menu Selection List:

- **sRGB** - (Multiple Sub-Function Selection Buttons)
- **Color Temperature** - (Multiple Sub-Function Selection Buttons)
- **Red** - (Level Adjust Function)
- **Green** - (Level Adjust Function)
- **Blue** - (Level Adjust Function)

Press the front panel "**SELECT**" key again to activate the **COLOR** menu. The OSD will auto-index to the first selection (**sRBG**) on the menu list. The selection will be highlighted with a raised background and a blue indicator dot as per the example below:

Press the front panel **[-]** or **[+]** keys to navigate through the Selection List.

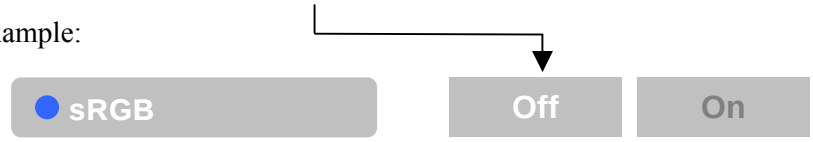
When the desired selection is highlighted, press the front panel "**SELECT"** key to access the highlighted selection.

After the desired selection is activated, press the front panel **[-]** or **[+]** keys to perform the following:

1) Choose the desired Sub-Function.

The currently selected Sub-Function will be distinguished by the white font color displayed on the Selection Button.

Example:

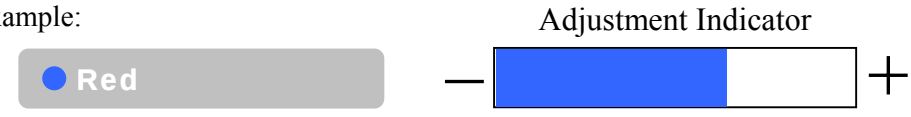


After the desired Sub-Function is highlighted, press the front panel "**SELECT"** key to activate the highlighted Sub-Function.

Press the front panel "**EXIT**" key one time to resume navigation in the Menu Selection List.

2) ***Adjust the desired Level.***

Example:



After the desired selection is activated, press the front panel **[-]** or **[+]** keys to set the desired level.

Press the front panel "**EXIT**" key one time to accept the desired level and resume navigation in the **COLOR Menu** Selection List.

Press the front panel “EXIT” key one additional time to resume navigation in the Top- Level OSD menu.

Pressing “EXIT” while in the Top-Level of the OSD menu will deactivate the OSD.

2.2.6 OSD MENU NAVIGATION – CONTROLS MENU

If the OSD is not visible, press the front panel “SELECT” key once to activate the OSD. Press the front panel [-] or [+] keys to navigate to the CONTROLS menu

Observe the following choices in the CONTROLS Menu Selection List:

- **Back Light** - (Level Adjust Function)

When the **CONTROLS** menu tab is highlighted, press the front panel “**SELECT”** key to access the **CONTROLS** menu. The OSD will auto-index to the first selection (**Back Light**) on the menu list. The selection will be highlighted with a raised background and a blue indicator dot as per the example below:

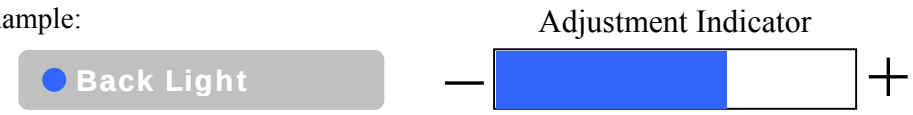
As only Back Light adjustment is available, the front panel **[-]** or **[+]** keys will not provide further navigation through the Selection List.

When the Back Light selection is highlighted, press the front panel “**SELECT”** key to activate the highlighted selection.

After the desired selection is activated, press the front panel **[-]** or **[+]** keys to perform the following:

1) ***Adjust the desired Level.***

Example:



After the desired selection is activated, press the front panel **[-]** or **[+]** keys to set the desired level.

Press the front panel “**EXIT**” key one time to accept the desired level and resume navigation in the Top- Level OSD menu

Pressing “EXIT” while in the Top-Level of the OSD menu will deactivate the OSD.

2.2.7 OSD MENU NAVIGATION – OSD/RESET MENU – FACTORY RESET

If the OSD is not visible, press the front panel "SELECT" key once to activate the OSD. Press the front panel [-] or [+] keys to navigate to the OSD/RESET menu

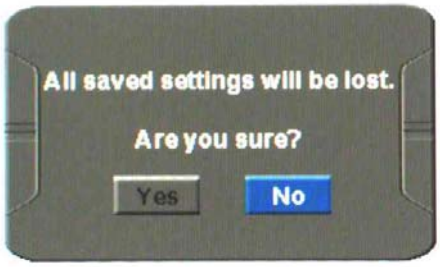
Observe the following choices in the OSD/RESET Menu Selection List:

- **Factory Reset** - (Single Sub-Function Selection Button)
- **Horizontal** - (Level Adjust Function)
- **Vertical** - (Level Adjust Function)
- **Blend** - (Level Adjust Function)
- **Time Out** - (Time Adjust Function)

Press the front panel "SELECT" key again to activate the OSD/RESET menu. The OSD will auto-index to the first selection (Factory Reset) on the menu list. The selection will be highlighted with a raised background and a blue indicator dot. See example below:

The Factory Reset selection has only one Sub-Function Selection Button. The Sub-Function Selection Button for this mode is auto-selected and highlighted in blue with a white font, when Factory Reset is chosen from the selection list. See example below:

Pressing the front panel "SELECT" key when **Factory Reset** is highlighted will activate the **Factory Reset OSD**. The **Factory Reset OSD (On Screen Display)** provides for acceptance or rejection of the **Factory Reset** process. See **Factory Reset OSD** example below:



When the **Factory Reset OSD** is displayed, press the front panel **[-]** or **[+]** keys to select the following:

- **No** *(Default Selection)* **– Do Not Perform Factory Reset**
- **Yes – Perform Factory Reset**

If "**No**" is highlighted, press the front panel "**SELECT"** or "**EXIT**" key to return to the OSD/RESET menu.

If "**Yes**" is highlighted, press the front panel "**SELECT"** key to activate **Factory Reset**. ***All previously saved settings will be lost when Factory Reset is activated.***

2.2.8 OSD MENU NAVIGATION – OSD/RESET MENU – STANDARD FUNCTIONS

If the OSD is not visible, press the front panel "SELECT" key once to activate the OSD. Press the front panel [-] or [+] keys to navigate to the OSD/RESET menu

Observe the following choices in the OSD/RESET Menu Selection List:

- **Factory Reset** - (Single Sub-Function Selection Button)
- **Horizontal** - (Level Adjust Function)
- **Vertical** - (Level Adjust Function)
- **Blend** - (Level Adjust Function)
- **Time Out** - (Time Adjust Function)

Press the front panel "**SELECT**" key again to activate the **OSD/RESET** menu. The OSD will auto-index to the first selection (**Factory Reset**) on the menu list. The selection will be highlighted with a raised background and a blue indicator dot. See example below:

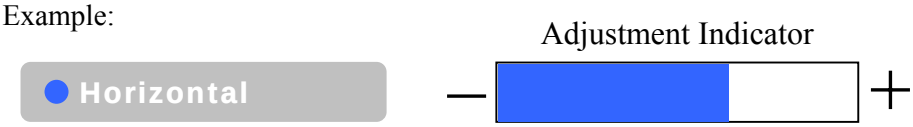
Press the front panel [-] or [+] keys to navigate through the Selection List.

When the desired (non Factory Reset) selection is highlighted, press the front panel "SELECT" key to access the highlighted selection.

After the desired selection is activated, press the front panel [-] or [+] keys to perform the following:

1) Choose the desired Sub-Function.

Example:



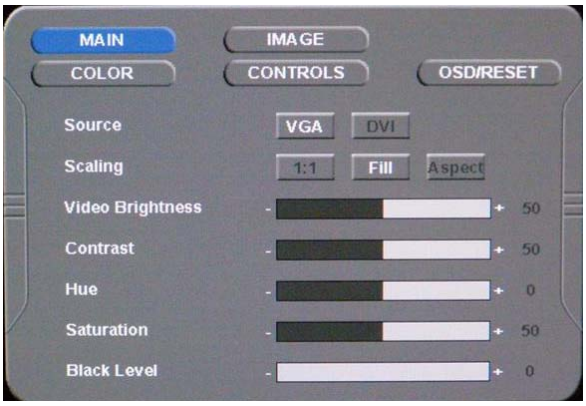
After the desired selection is activated, press the front panel **[-]** or **[+]** keys to set the desired level.

Press the front panel "**EXIT**" key one time to accept the desired level and resume navigation in the **COLOR Menu** Selection List.

Press the front panel "EXIT" key one additional time to resume navigation in the Top- Level OSD menu.

Pressing "EXIT" while in the Top-Level of the OSD menu will deactivate the OSD.

2.2.9 OSD MENU – SAMPLE IMAGES



MAIN (VGA)

MAIN (DVI)

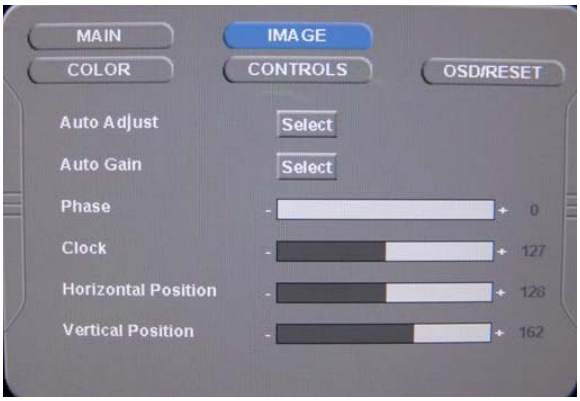
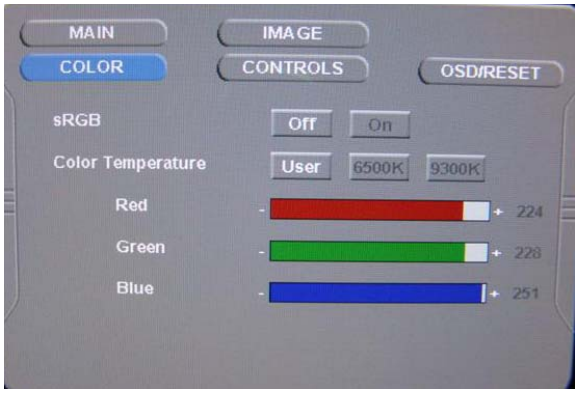
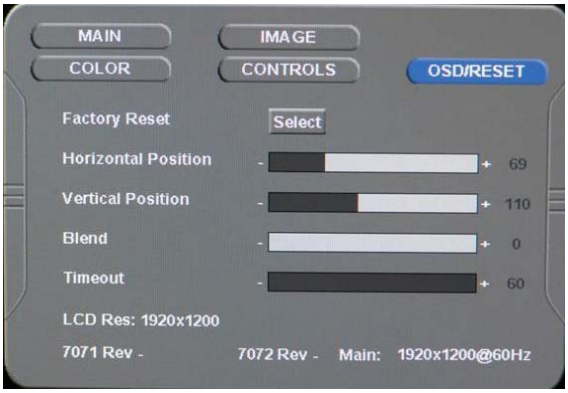


IMAGE (VGA)



COLOR

CONTROLS



OSD/RESET

2.2.10 REMOTE DISPLAY INTERFACE (SERIAL CONTROL – RS-232)

2.2.10.1 RS-232 Serial Interface - Interrogation and Control

The RS-232 Serial Interface provides for the interrogation and control of the following display functions:

- Main Source Select

2.2.10.2 Interface Protocol

The Interface Protocol is standard asynchronous RS-232 serial I/O

- Start Bit = 1
- Stop Bit = 1
- Data Bits = 8
- Baud Rate = 115.2K
- Handshake = None (Only Transmit "TX" and Receive "RX" lines are used)
- Message Length = 5 bytes
-

2.2.10.3 READ / WRITE Commands

MESSAGE PROTOCOL TABLE

STX	READ / WRITE	ADDRESS	DATA	ETX
0x02	Read = 0x55 Write = 0xAA	0xXX	0xYY	0x03

A **"READ"** command is issued to read the current value of the variable being addressed.

A "**WRITE**" command is issued to change the current value of the variable being addressed.

2.2.11 REMOTE DISPLAY INTERFACE – FUNCTION MESSAGES

2.2.11.1 Main Source (VGA / DVI) Select

The Main Source control function provides the following options:

- VGA (RGB)
- DVI (Digital Video)

Mode and Hex Value Data Table

Main Source Input	HEX Data	HEX Data (Read Range)	HEX Data (Write Range)
VGA (RGB)	10	00 - FF	10 - 11
DVI (Digital)	11		

Main Source Message – VGA Example
(Send Request for Value)

MODE	STX	READ	HEX ADDRESS	HEX DATA	ETX
SEND (Read Command)	02	55	10	00	03
Auto Receive	02	55	10	10	03

Interpreting Received Data

HEX DATA = **10**
Received Value = **VGA (RGB)**

Main Source Message – Video Example
(Set Source to DVI)

MODE	STX	WRITE	HEX ADDRESS	HEX DATA	ETX
SEND (Write Command)	02	AA	10	11	03
Auto Receive	02	AA	10	11	03

Converting Desired Source to HEX DATA

Desired Value = **DVI (Digital)**

Use HEX DATA value **11** in **SEND (Write)** message string

3. MAINTENANCE

Field Maintenance should be limited to front panel adjustments, and external cleaning. Any action that requires opening the monitor chassis should be deferred to the depot or factory.

3.1 PREVENTIVE MAINTENANCE

The only periodic maintenance recommended is EXTERIOR SURFACE cleaning when necessary.

3.1.1 Air Filter Maintenance

Depending on the environment, the air filters on the rear panel should be inspected periodically and cleaned as required with clean, dry, low pressure air or rinse with water and dried thoroughly.

3.1.2 Surface Cleaning

The window and exterior surfaces may be cleaned with isopropyl alcohol followed by distilled water rinse, applied with a soft cloth to avoid scratching the anti-reflective coating on the glass panel.

NOTE: INTERIOR CLEANING OF THE MONITOR IS NEITHER REQUIRED NOR RECOMMENDED.

3.1.3 Image Persistence

Image persistence is the occurrence of a ghost image that remains on the display screen even after the display monitor has been turned off. Unlike cathode ray tube monitors that permanently burn the image into the phosphors, with liquid crystal displays, image persistence is not permanent. LCD's suffering from image persistence can be cleared by turning off the display monitor for a period equivalent to the duration in time that the offending image was displayed. If the image was displayed for one hour, turn the monitor off for one hour to erase the ghost image.

NOTE: The use of a screen saver is recommended whenever the screen is idle.

3.2 CORRECTIVE MAINTENANCE

Any corrective maintenance should be deferred to the depot or factory.

4. 4424S SPECIFICATIONS

4.1 LCD Module

- Active matrix thin film transistor (TFT) liquid crystal display (LCD)
- Native Resolution (Pixel Count): 1920 (H) x 1200 V)
- Pixel pitch: 0.270 mm (H) x 0.270 mm (V)
- Aspect Ratio: 16:10
- Viewing angle: ±80° (typical all directions with more than 10:1 contrast ratio)
- Contrast Ratio: 1000:1 typical (dark environment)
- Display colors: 16,777,216
- Dimming Range: 0% to 100%
- Diagonal: 24" nominal
- Viewable Image Size: 518.4mm (20.41") H, 324.0mm (12.76") V nominal

4.2 RGB Video Input Signal

- Video: Analog 0 to 0.8 Vp-p (0.7 Vp-p/75 Ohms)
- Sync: Separate Sync TTL Level; Horizontal Sync Positive/Negative; Vertical Sync Positive/Negative; Composite Sync Positive/Negative, TTL Level; Sync on Green Video (Positive) 0.7 Vp-p and sync Negative 0.3 Vp-p

4.3 DIGITAL Video Input Signal

- Digital Visual Interface DVI-D as defined by the Digital Display Working Group

4.4 Refresh Rate

- Vertical: 55 Hz to 85 Hz

4.5 Backlight Brightness

- 250 cd/m^2 minimum with EMI faceplate

4.6 VESA Resolutions Supported

NOTE

Resolution is based on horizontal and vertical frequencies only.

MODE #	VIDEO MODE INPUT	Vertical Refresh Rate	Horizontal Frequency	Pixel Frequency	Standard Mode
1	640 x 400	85 Hz	37.9 KHz	31.500 MHz	DOS
2	640 x 480	60 Hz	31.5 KHz	25.175 MHz	VGA
3	640 x 480	72 Hz	37.9 KHz	31.500 MHz	VGA
4	640 x 480	75 Hz	37.5 KHz	31.500 MHz	VGA
5	640 x 480	85 Hz	43.3 KHz	36.000 MHz	VGA
6	720 x 400	85 Hz	37.9 KHz	35.500 MHz	VGA
7	800 x 600	56 Hz	35.1 KHz	36.000 MHz	SVGA
8	800 x 600	60 Hz	37.9 KHz	40.000 MHz	SVGA
9	800 x 600	72 Hz	48.1 KHz	50.000 MHz	SVGA
10	800 x 600	75 Hz	46.9 KHz	49.500 MHz	SVGA
11	800 x 600	85 Hz	53.7 KHz	56.250 MHz	SVGA
12	1024 x 768	60 Hz	48.4 KHz	65.000 MHz	XGA
13	1024 x 768	70 Hz	56.5 KHz	75.000 MHz	XGA
14	1024 x 768	75 Hz	60.0 KHz	78.750 MHz	XGA
15	1024 x 768	85 Hz	68.7 KHz	94.500 MHz	XGA
16	1280 x 1024	60 Hz	64.0 KHz	108.000 MHz	SXGA
17	1280 x 1024	75 Hz	80.0 KHz	135.000 MHz	SXGA
18	1600 x 1200	60 Hz	75.0 KHz	162.000 MHz	UXGA
19	1920 x 1200	60 Hz	74.0 KHz	154.000 MHz	WUXGA

4.7 RS-232 HOST Serial interface

Serial Interface Protocol

Communication with the host is via an asynchronous RS232 standard serial I/O: one start bit, eight data bits, and one stop bit at 115.2 K baud. Only the transmit data (TX) and receive data (RX) signal lines are used (no handshaking). All messages are five bytes in length:

STX	READ or WRITE	ADDRESS	DATA	ETX
0x02	READ = 0x55 Write = 0xAA	0xXX	0xYY	0x03

A “READ” or “WRITE” command can be sent to read the current selected video input source, or to change the current selected video input source. The DATA reflects the value shown on the corresponding On-Screen-Display selection.

Main source select:

STX	READ or WRITE	ADDRESS	DATA	ETX
0x02	READ = 0x55 Write = 0xAA	0x10	VGA = 0x10 DVI = 0x11	0x03

4.8 Power Consumption

- Input 115 VAC 60Hz single-phase at 0.945 Amps, 104 W (typ.)

4.9 Dimensions

See the dimension drawings at the back of this Users Guide.

4.10 Weight

- Rack (24-IN) or Console Mount: 24.2 lbs Nominal

4.11 Operating Environment

- Temperature: 0°C to 50°C; MIL-STD-810E Method 501/502, Procedure II
- Humidity: 5% to 95% non-condensing; MIL-STD-810E, Method 507, Procedure I
- Shock: MIL-S-901D, Grade A, Class I, Type A
- Vibration: MIL-STD-167-1A, Type I
- Drip Proof: MIL-STD-810E, Method 506, Procedure II, Front Panel Only
- Altitude: MIL-STD-810E, Method 500, Procedure II, 0 - 15,000 feet above sea level
- Sand and Dust: MIL-STD-810E, Method 510, Procedures I & II, Front Panel Only
- Acoustic Noise: Free Air, 1 M in front: ≤ 50dba
  Free Air, 1 M in rear: ≤ 55dba

- EMI: MIL-STD-461E:

CE101	Conducted Emissions, Power Leads, 30 Hz to 10 kHz
CE102	Conducted Emissions, Power Leads, 10 kHz to 10 MHz
CS101	Conducted Susceptibility, Power Leads, 30 Hz to 150 kHz
CS114	Conducted Susceptibility, Bulk Cable Injection, 10 kHz to 200 MHz
CS116	Conducted Susceptibility, Damped Sinusoidal Transience, Cables and Power lead, 10kHz to 100MHz
RE102	Radiated Emissions, Electric Field, 10 kHz to 18 GHz
RS101	Radiated Susceptibility, Magnetic Field, 30 Hz to 100 kHz
RS103	Radiated Susceptibility, Electric Field, 2 MHz to 18 GHz (10V/m)

- DC Magnetic Field: DOD-STD-1399, Section 070, Part 1, using a DC magnetic field of 20 Oersteds (1600 A/m) operating

4.12 Non-Operating Environment

- Temperature: -20°C to +60°C; MIL-STD-810E, Method 501/502, Procedure I
- Transportation: MIL-STD-810E, Method 514, Procedure I, Basic Condition I-3.2.1, Common Carrier: Fig 514.4-1, 514.3-2, 514.4-3, 1 hour per axis, 3 axes
- Altitude: MIL-STD-810E, Method 500, 0 - 40,000 ft. above sea level

5. TROUBLESHOOTING TIPS

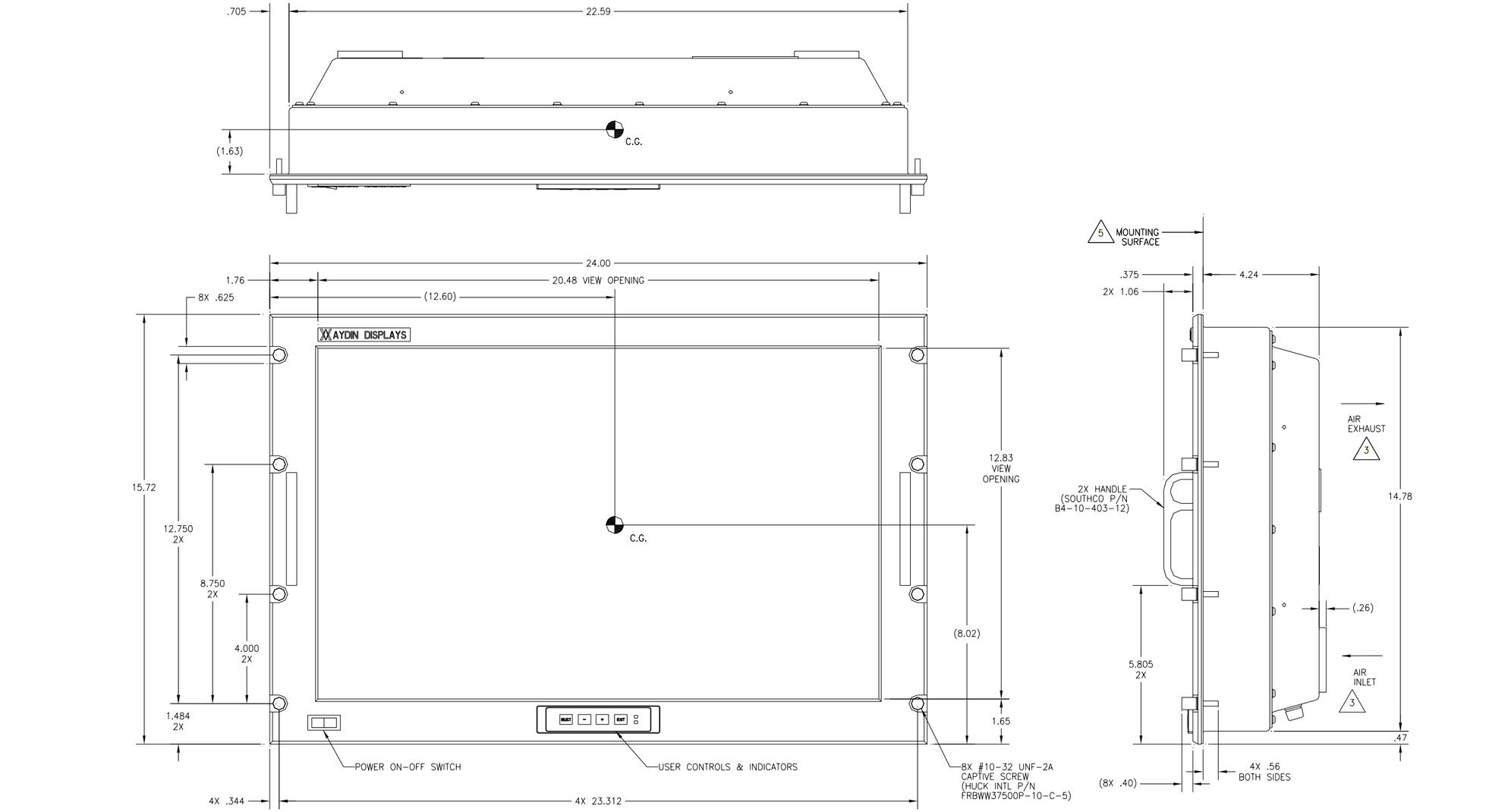
If you experience trouble with your 4424 LCD display, check the following items before contacting Aydin Displays or your dealer.

Trouble	Troubleshooting Tip
No picture	• The signal cable should be completely connected to the display card/computer. • The display card should be completely seated in the slot. • Display power connector should be plugged in and computer power switch should be in the ON position. Make sure that a supported mode has been selected on the display card. Please check your display card or system manual to change graphics mode. • Check the LCD Display and your display card for compatibility and recommended settings. • Check the signal cable connector for bent or pushed-in pins. • Check if the correct video input source is selected in the display. • Make certain the computer is not in a power-saving mode (touch the keyboard or mouse.)
Image persistence.	• Image persistence occurs when a ghost of an image remains on the screen even after the monitor has been turned off. Unlike a CRT monitor, a LCD monitor's image persistence is not permanent. To erase an image ghost, turn the monitor off for as long as the image was displayed. If an image was on the monitor for an hour and a ghost of that image remains, the monitor should be turned off for an hour to erase the image. To avoid this problem, use a screen saver whenever the screen is idle.
Image is unstable, unfocused or swimming is apparent.	• Signal cable should be completely attached to the computer. • Use the controls to focus and readjust the display for optimum operation. When the display mode is changed, settings may need to be readjusted. • Check the monitor and your display card for compatibility and recommended signal timings.
Power LED on monitor is not lit.	• Power cable should be connected and plugged into an AC power source.
Display image is not sized properly.	• Use the width control to adjust horizontal size. • Ensure that a supported mode is selected on the display card or system being used. Consult the display card or system manual to change graphics mode. • Check if the desired scaling factor is selected.

If these troubleshooting tips do not solve your problem, contact Aydin Displays Customer Support at 610-404-5370 or fax us at 610-404-8186

6. 4424S DISPLAY DIMENSIONS

For clarity, displays are shown without signal and power cables.



NOTES:

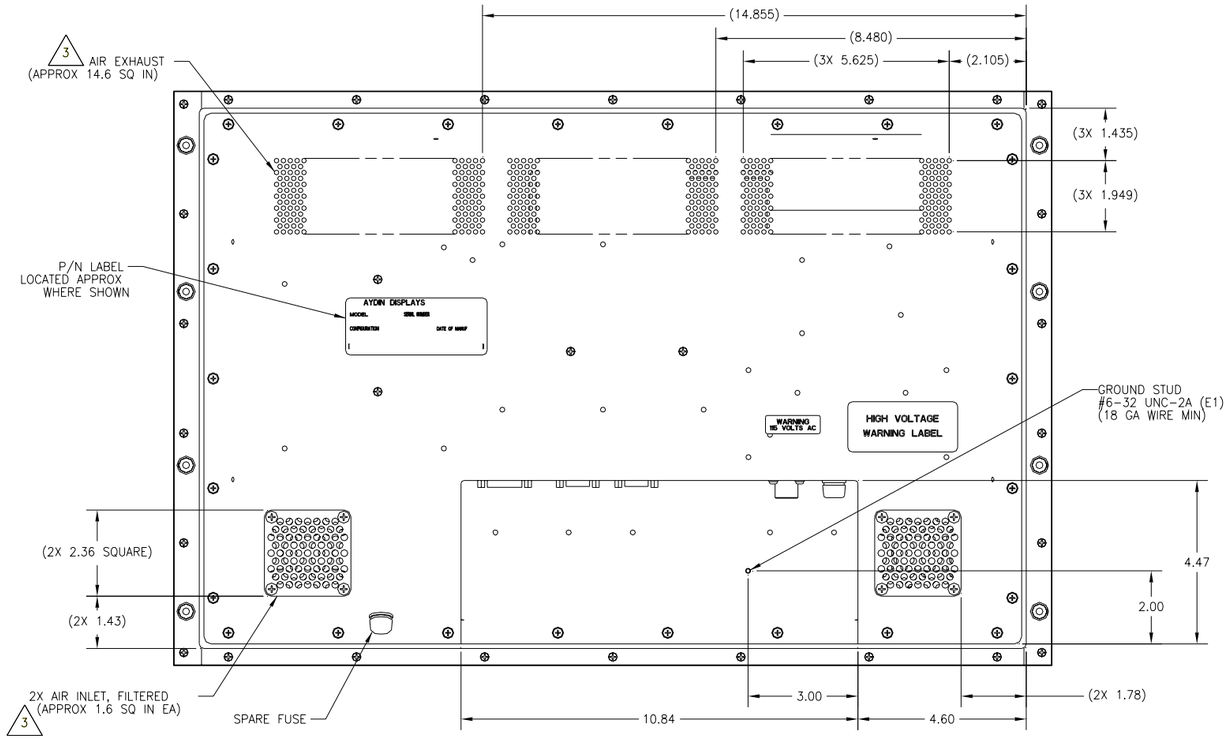
1. TOLERANCES: .XX = ±0.04 UNLESS OTHERWISE SPECIFIED.
   .XXX = ±0.020
2. WEIGHT: 24.2 LBS.
3. CLEARANCE IN REAR OF UNIT TO BE APPROX 4 INCHES FOR ADEQUATE COOLING.
4. REFER TO FUNCTIONAL SPECIFICATION, NO. 286-7100, FOR MORE INFORMATION.

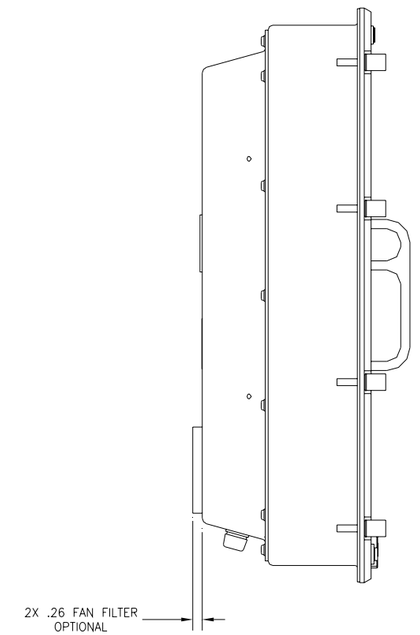
FRONT VIEW

5 MOUNTING SURFACE OF CONSOLE MUST BE FLAT ±.030.

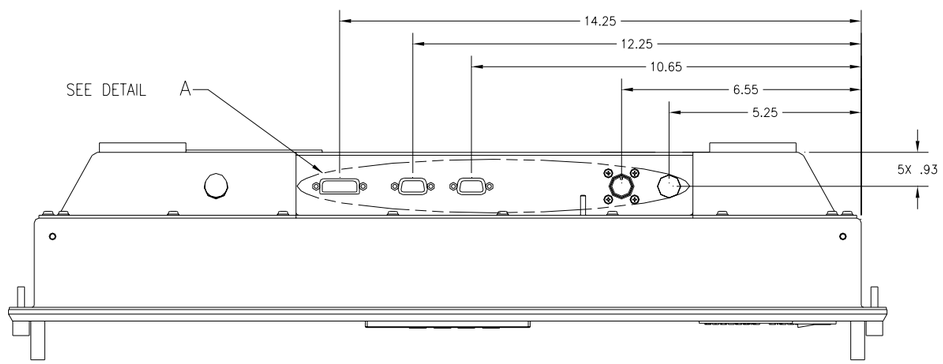
AYDIN DISPLAYS INC	
TITLE:	OUTLINE DRAWING, P/N 356-7040-501 (MODEL 4424S)
DRAWING NUMBER	353-7216
DATE: 21-JUN-10	

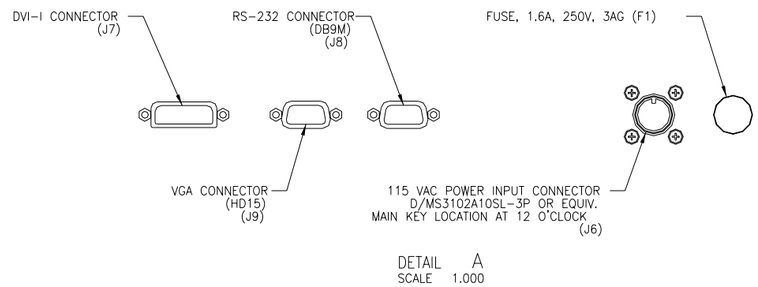
4424S DISPLAY DIMENSIONS CONT.





REAR VIEW





DETAIL A
SCALE 1.000

TITLE:	OUTLINE DRAWING, P/N 356-7040-501
DRAWING NUMBER:	353-7216
DATE:	21-JUN-10